



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF	James R. Woodward, et al.
FOR	ELIMINATION OF WELD IN CERAMIC METAL HALIDE ELECTRODE-LEADWIRE
SERIAL NO	09/393,563
FILED	September 10, 1999
EXAMINER	GUHARAY, K.
ART UNIT	2879
LAST OFFICE ACTION	May 23, 2003
ATTORNEY DOCKET NO	GEC 2 0340 LD 10956
	Cleveland, Ohio 44114-2518

DECLARATION UNDER 37 C.F.R. §1.131

Mail Stop – No Fee
Commissioner For Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

1. We, James R. Woodward and James T. Dakin, do hereby declare and say that we are joint inventors in the above-identified United States patent application, Serial No. 09/440,424.

2. We have read and are familiar with the Office Action issued May 23, 2003 in connection with the above-identified United States patent application. We have further read and are familiar with U.S. Patents Nos. 6,208,070 B1 issued to Sugimoto (hereinafter "the 070 patent")

3. This Declaration is to establish possession of the invention in this application in the United States at a date prior to December 22, 1998, which is the effective date of the '070 patent, and diligence therefrom to the date of filing of the present application. This Declaration is being submitted prior to a final rejection issuing in the above-identified patent application.

4. To establish possession of the invention at least prior to December 22, 1998, attached please find a redacted copy of an Invention Disclosure, submitted to General Electric Patent Operation #1200 and to the General Electric Patent Coordinator (Exhibit 1, 2 pages) as evidence of possession of the invention. We hereby declare that the relevant portions of Exhibit 1 predate December 22, 1998, the effective date of the '070 patent.

5. In particular, Exhibit 1 describes the present invention which comprises a ceramic metal halide lamp that replaces the traditional 3-part electrode/leadwire with a 2-part electrode/leadwire. As explained in Exhibit 1, a 2-part electrode/leadwire in accordance with the present invention can be made by using a single 0.304 mm OD tungsten wire for the electrode shank and the overwind component mandrel. Furthermore, the electrode tip coil and overwind could be made from a second 0.175 mm OD tungsten wire.

6. Each date redacted in Exhibit 1 is at least prior to December 22, 1998, the effective date of the '070 patent.

7. It is submitted that the information attached as Exhibit 1 clearly demonstrates possession of the inventive ceramic metal halide lamp which comprises an envelope, an elongated interior chamber disposed within the envelope having a lamp body located therein, at least one electrode lead partially housed by the interior chamber, and a single continuous elongated mandrel forming a shaft of the electrode lead in this country at a date at least prior to December 22, 1998.

8. To establish reduction to practice of the invention prior to December 22, 1998, attached please find redacted copies of several documents (collectively labeled as Exhibit 2, 4 pages) documenting this. Specifically, attached are:

A) An email from Mark Duffy reporting the first work to seal the inventive two part leads into arc tubes.

B) An email from Bernard Bewley, a metallurgist involved in the project who was responsible for procuring key components and detailing thermal stress modeling of the subject leads.

C) A lab notebook log entry detailing the sealing process for the two part leads (designated CMH66).

D) Copies of x-rays showing arctubes with the inventive two part leads.

9. We hereby declare that all the relevant portions of Exhibit 2 predate December 22, 1998, the effective date of the '070 reference.

10. It is submitted that the above information evidences a date of conception and reduction to practice prior to December 22, 1999.

11. We hereby declare that all statements made herein are of our own knowledge and are true and that all statements are made on information and belief and are believed to be true and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.


James R. Woodward

Date: 6 Aug - 03


James T. Dakin

Date: 6 Aug - 03

Exhibit 1

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Agency Information	GE LIGHTING	FOR PATENT OPERATION USE
	Invention Disclosure	Docket No. 20 10956
Patent Coordinator	Send original to Patent Operation #1200 and copy to designated Patent Coordinator	Date Opened
Jack Strok		Assigned Attorney GEN

RECEIVED

TITLE 2-piece CMH electrode leadwire

PRODUCT LINE: Ceramic Metal Halide Lamp

PATENT ADMINISTRATOR

DESCRIPTION OF INVENTION (use additional sheets for illustrations as needed)

The invention is to replace the current 3-part electrode/leadwire used in Ceramic Metal Halide (CMH) lamps with a 2-part electrode/leadwire. The 3-part electrode/leadwire used in the 70W and 100W CMH lamps consists of an W electrode tip, a Mo overwind section and Nb lead welded together.

A 2-part electrode/leadwire can be made by using a single 0.304mm OD W wire for the electrode shank and the overwind component mandrel. The electrode tip coil and overwind would be made from a second 0.175mm OD W wire.

The dimensions for the W electrode tip would be the same as current design. The OD of the overwind section would be the same as current design.

The advantages of this design change would be:

1. No weld needed between electrode tip and overwind section, increasing yields of welding process and reducing lamp shrinkage and early failures due to broken tips.
2. Improved concentricity of electrode tip, increasing lamp life and performance by reducing arc tube wall corrosion.
3. More consistent heat conduction from electrode tip, increasing lamp life by reducing tip burn back and operating voltage rise.
4. The CMH W electrode automated tip maker should be able to manufacture this electrode tip/overwind component at an acceptable variable cost.

The differences with current design would be:

1. W instead of Mo as material for overwind section
2. Overwind mandrel diameter 0.304 instead of 0.406mm
3. Overwind wire diameter 0.175 instead of 0.127mm

EACH INVENTOR Must Sign and Date Each page of the disclosure and Each sheet of any illustration.

Print Name	Inventor's Signature (FULL)	Date	Component #
James Robert Woodward	<i>James R. Woodward</i>		7101

TWO WITNESSES (other than inventor) who have READ and UNDERSTOOD the disclosure Must Sign and Date Each page of the disclosure and Each sheet of any illustration.

Print Name	Witness's Signature	Date
Jack Strok	<i>Jack Strok</i>	
Jim Dakin	<i>James D. Dakin</i>	

One piece Tungsten electrode tip and overwind for 70 and 100W CMH lamps



Finished component: 0.3035mm mandrel wire diameter
 0.1750mm overwind wire diameter
 0.66mm outside diameter
 4.5 +/- 0.5 turns (0.81 +/- 0.075mm)
 2.2 +/- 0.075mm space
 9mm +/- 0.1mm overwind

Laser cut ends
 Laser tacked overwind

Advantages:

No weld to be made between electrode tip and overwind
 increased yields during leadwire welding
 reduced lamp shrinkage and failures due to tip breaking
 Better coaxial location of electrode tip
 reduced arc tube wall corrosion; increasing lamp life
 More uniform heat conduction
 reduced voltage rise

Design changes:

2 piece instead of 3 piece electrode/leadwire
 Tungsten instead of Moly for overwind section
 While overwind outsider diameter remains unchanged,
 mandrel diameter 0.304 instead of 0.406mm
 overwind diameter 0.175 instead of 0.127mm

R. Woodward

Wover.ppt

James R. Woodward

Exhibit 2

Page 1 of 4

Dakin, James T (GEL,MSX)

From: Duffy, Mark F (GEL,MSX)
Sent: [REDACTED]
To: Berry, Tommie (GEL,MSX); Boroczki, Agoston (GEL,MSX); Chalmers, Alan G (GEL,MSX); Childs, Bill; Coxon, Eric (GEL,MSX); Dakin, James T (GEL,MSX); Deluca, John A (CRD); Gordon, Brian L (GEL,MSX); Heindl, Raymond A (GEL,MSX); Mucklejohn, Stuart (GEL,MSX); Ning, Changlong (GEL,MSX); Odeh, Eddie (GEL,MSX); Preston, Barry (GEL,MSX); Ramaiah, Raghu (GEL,MSX); Scott, Curtis E (GEL,MSX); Sommerer, Timothy L (CRD); Woodward, Robert L (GEL,MSX); Yous, Mark (GEL,MSX)
Subject: Two-piece electrode test (CMH66)

Friends

We have completed the arc tube build for a test of two piece (W-Nb) electrodes. There are 26 arc tubes to be shipped to Leicester for G12 finishing and lifetesting. A key observation has already been made in this test! A severely high leg cracking probability (0.425/seal) is seen for the two piece electrodes using the standard sealing process. The comparison is as follows.

Electrode	Seals	Cracks	Probability	95% LCL	95% UCL	Good AT's
2-piece W-Nb	40	17	0.425	0.260	0.568	8
3-piece W-Mo-Nb	39	1	0.026	0.000	0.074	18

The difference is highly significant.

In proceeding forward with the evaluation of two piece electrodes, we would like to test the early life survival rate. If the lamps with 2-piece electrodes are able to survive the rigors of temperature stress during lifetesting, then it may justify working to develop a new sealing process on our existing equipment. Alternatively, we could hold this idea on the back burner for when the next generation of sealing process is developed.

Attached is the arc tube construction information.



Cheers,

Mark

Exhibit 2

Page 2 of 4

Dakin, James T (GEL,MSX)

From: Bewlay, Bernard P (CRD)

Sent: [REDACTED]

To: Dakin, James T (GEL,MSX), Woodward, Rob (GEL,MSX)

Cc: Sommerer, Timothy J (CRD)

Subject: RL two component leadwire

Jim

James Howard and I were involved. I had some micrographs still I believe. I think the work was in late early [REDACTED]. We also did quite a bit of thermal stress modeling in [REDACTED]. This was all pre the [REDACTED] date (application or issue?)

Bernard

WTS FOR CMH65 (150/G12, w/ CERMETS)

2.90

GAP = 10.0 mm.

- 2.1

IN CMH64, SSC SETTING OF

0.8

3.130 GAVE GAP = 7.500 mm.

x 2.

SO WE NEED TO INCREASE GAP

= 1.6

BY 2.50 mm. CHANGE SSC

SETTING TO 5.63 mm.

NAKE

AVG GAP (N=4) WAS 10.150, S=0.06.

5.63 - 0.15 = 5.48 NEW SETTING

SHOULD

SSC setup for CMH66 (2-pc electrode test)

3)

From data in SSCIMP.XLS, to get 6.9 mm gap, the setting should be 2.58

2.04 N=11

SSC setup - CMH67

IN CMH66, GAP WAS 7.016 w/ SETTING OF 2.580 WE WANT 6.900 mm, SO

CHANGE SETTING TO 2.464

(N=11)

SSC SETUP -

2.464 SETTING GAVE 6.834 GAP. WANT TO CHG TO 7.900, SO SET TO 3.530

2.05 N=11

3.085

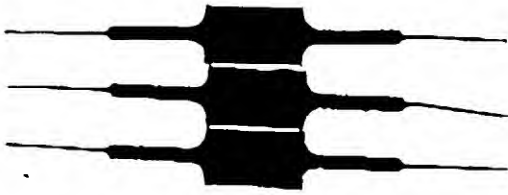
+ .045

3.13

Exhibit 2

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2

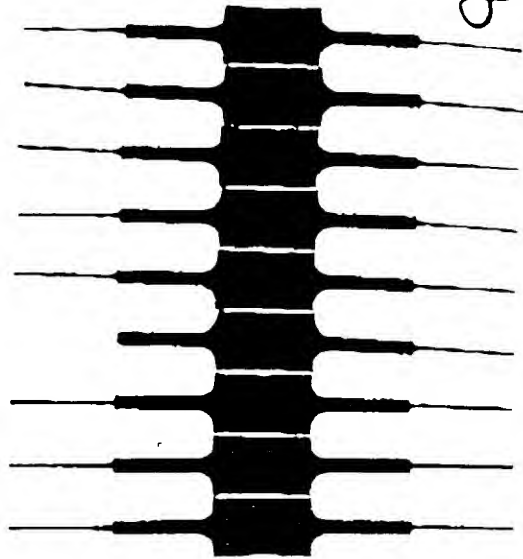


55
09

10

14

9



5512

13

14

15

17

19

20

21

27

CMH66 — 2pc elec

CMH66

CMH66 — 2pc electrode



80

60

90

50

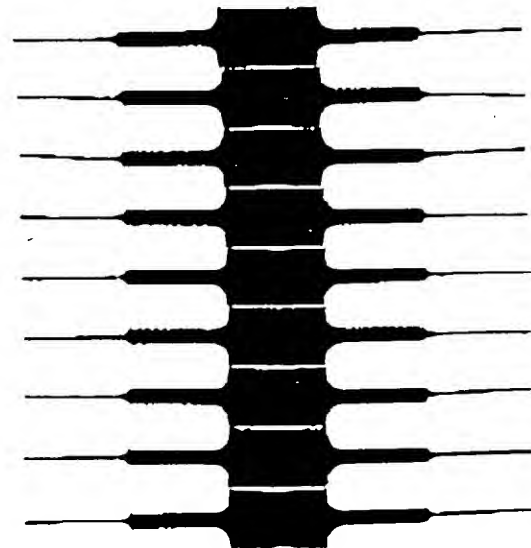
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CMH66 PRE-TEST